MONO POWER AMPLIFIER

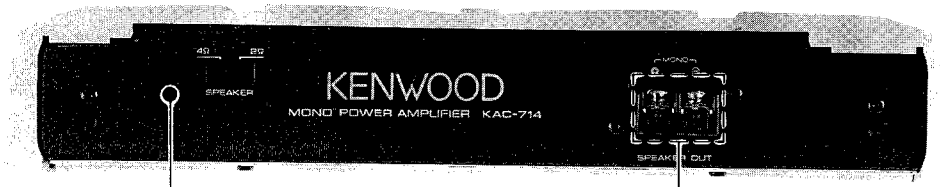
KAC-714

SERVICE MANUAL

KENWOOD

© 1993-4 PRINTED IN JAPAN
B51-6574-00(O)3866

This unit is a monaural amplifier for bass sound reproduction only. It cannot be used as an ordinary stereo full-range amplifier.

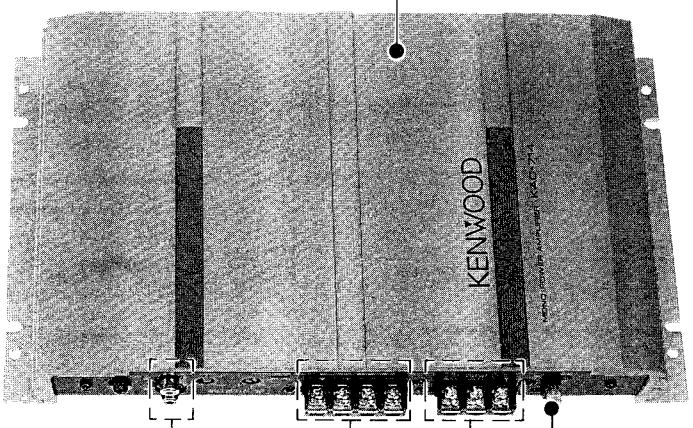


Panel
(A64-0062-03)

Screw terminal board (2P)
(E70-0810-05)

Screw set
(N99-1587-05)

Heat sink
(F01-1422-01)



Fuse (20A)
(F05-2038-05)

Accessory
(W01-0725-05)
E type only

Phono jack (2P)
(E63-0818-05)

Screw terminal board (3P)
(E70-0807-05)

Screw terminal board (4P)
(E70-0811-05)

KAC-714

CONTENTS / CONNECTIONS

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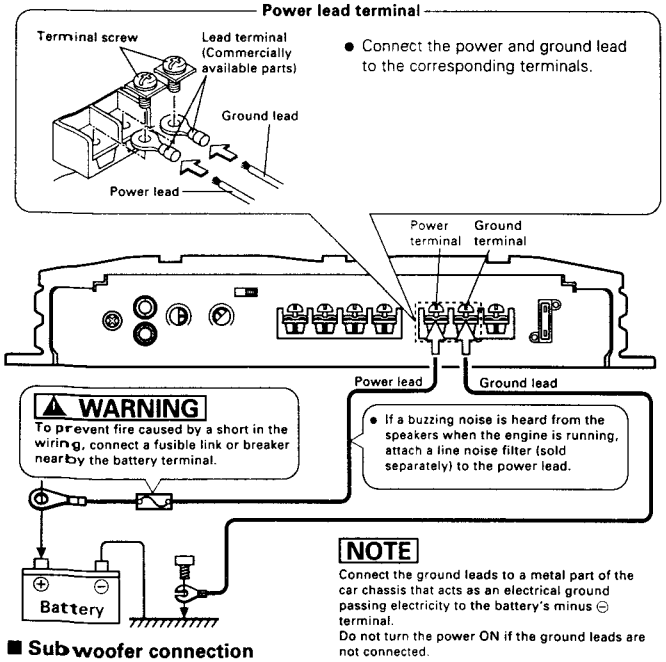
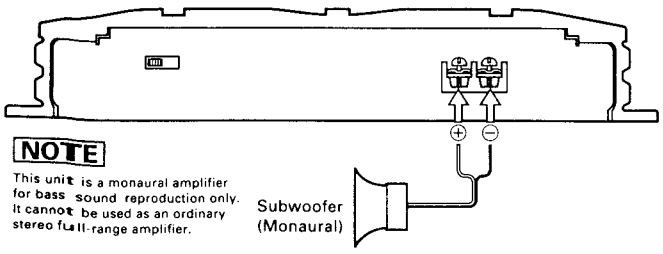
Connections

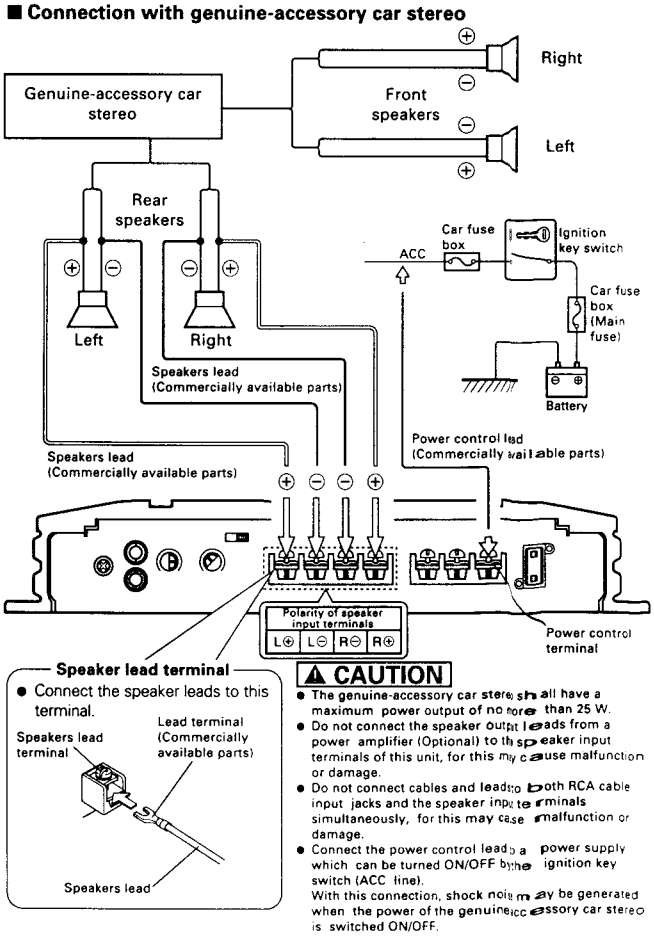
■ Power connection


Power lead terminal
Terminal screw
Lead terminal (Commercially available parts)
Ground lead
Power lead
● Connect the power and ground lead to the corresponding terminals.
Power terminal
Ground terminal
Power lead
Ground lead
WARNING
To prevent fire caused by a short in the wiring, connect a fusible link or breaker nearby the battery terminal.
● If a buzzing noise is heard from the speakers when the engine is running, attach a line noise filter (sold separately) to the power lead.
Battery
NOTE
Connect the ground leads to a metal part of the car chassis that acts as an electrical ground passing electricity to the battery's minus ⊖ terminal.
Do not turn the power ON if the ground leads are not connected.

■ Subwoofer connection

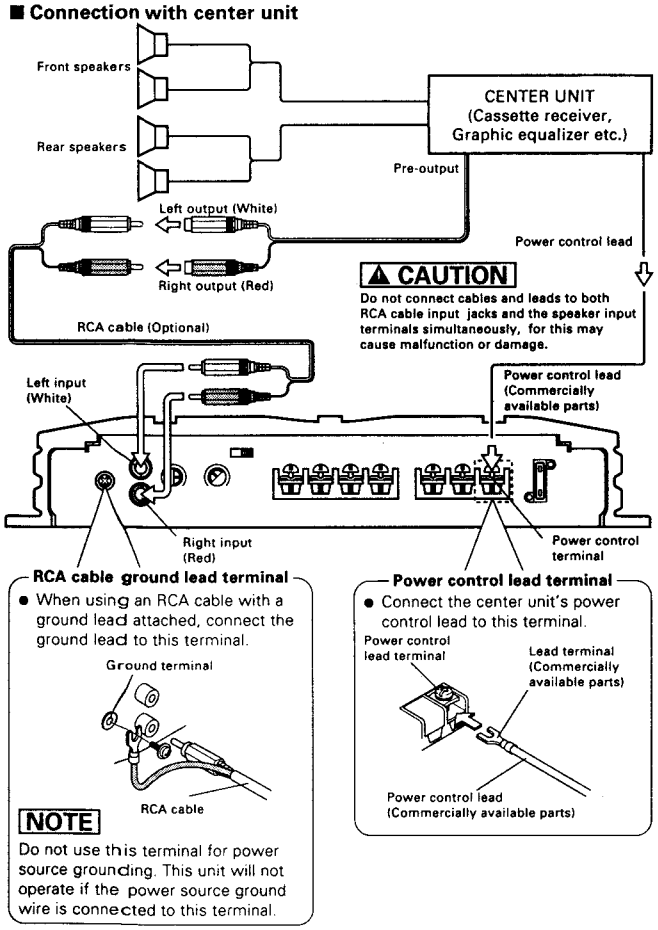

NOTE
This unit is a monaural amplifier for bass sound reproduction only. It cannot be used as an ordinary stereo full-range amplifier.
Subwoofer (Monaural)

■ Connection with genuine-accessory car stereo


Genuine-accessory car stereo
Front speakers
Right
Left
Rear speakers
Left
Right
Speakers lead (Commercially available parts)
Car fuse box
ACC
Ignition key switch
Car fuse box (Main fuse)
Battery
Power control lead (Commercially available parts)
Speakers lead (Commercially available parts)
Polarity of speaker input terminals
L⊕ L⊖ R⊖ R⊕
Power control terminal
Speaker lead terminal
● Connect the speaker leads to this terminal.
Speakers lead terminal
Lead terminal (Commercially available parts)
Speakers lead
CAUTION
● The genuine-accessory car stereo shall have a maximum power output of no more than 25 W.
● Do not connect the speaker output leads from a power amplifier (Optional) to the speaker input terminals of this unit, for this may cause malfunction or damage.
● Do not connect cables and leads to both RCA cable input jacks and the speaker input terminals simultaneously, for this may cause malfunction or damage.
● Connect the power control lead to a power supply which can be turned ON/OFF by the ignition key switch (ACC line).
With this connection, shock noise may be generated when the power of the genuine-accessory car stereo is switched ON/OFF.

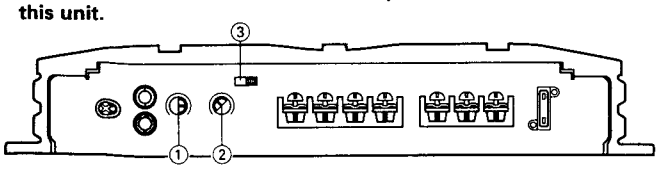
CONNECTIONS / CONTROLS

■ Connection with center unit


Front speakers
Rear speakers
CENTER UNIT
(Cassette receiver,
Graphic equalizer etc.)
Pre-output
Left output (White)
Right output (Red)
Power control lead
⚠ CAUTION
Do not connect cables and leads to both RCA cable input jacks and the speaker input terminals simultaneously, for this may cause malfunction or damage.
RCA cable (Optional)
Left input (White)
Power control lead (Commercially available parts)
Right input (Red)
Power control terminal
RCA cable ground lead terminal
● When using an RCA cable with a ground lead attached, connect the ground lead to this terminal.
Ground terminal
RCA cable
NOTE
Do not use this terminal for power source grounding. This unit will not operate if the power source ground wire is connected to this terminal.
Power control lead terminal
● Connect the center unit's power control lead to this terminal.
Power control lead terminal
Lead terminal (Commercially available parts)
Power control lead (Commercially available parts)

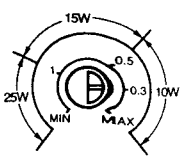
Controls

■ Operations of the following control and switches are required in accordance with the center unit and speakers connected with this unit.



①Input sensitivity control

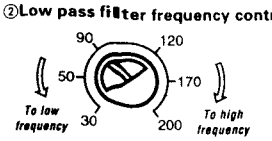
Set this control according to the pre-output level of the center unit connected with this unit, or to the maximum power output of the genuine-accessory car stereo. For the pre-output level or the maximum power output, refer to the "SPECIFICATIONS" in the instruction manual of the center unit.



Refer to the table below when setting the input sensitivity control according to the pre-output level of the center unit. Refer to the illustration on the left when setting the input sensitivity control according to the maximum power output of the genuine-accessory car stereo.

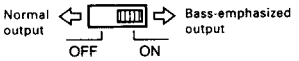
Center unit pre-out level	Amplifier input sensitivity
800~1000 mV	0.3 V

②Low pass filter frequency control (18 dB/oct.)

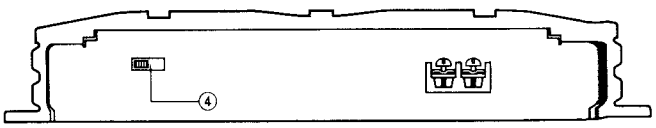


This control adjusts the frequency band output from this unit.

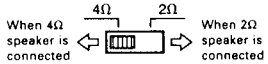
③Bass emphasis switch



This switch allows to emphasize the output from this unit.

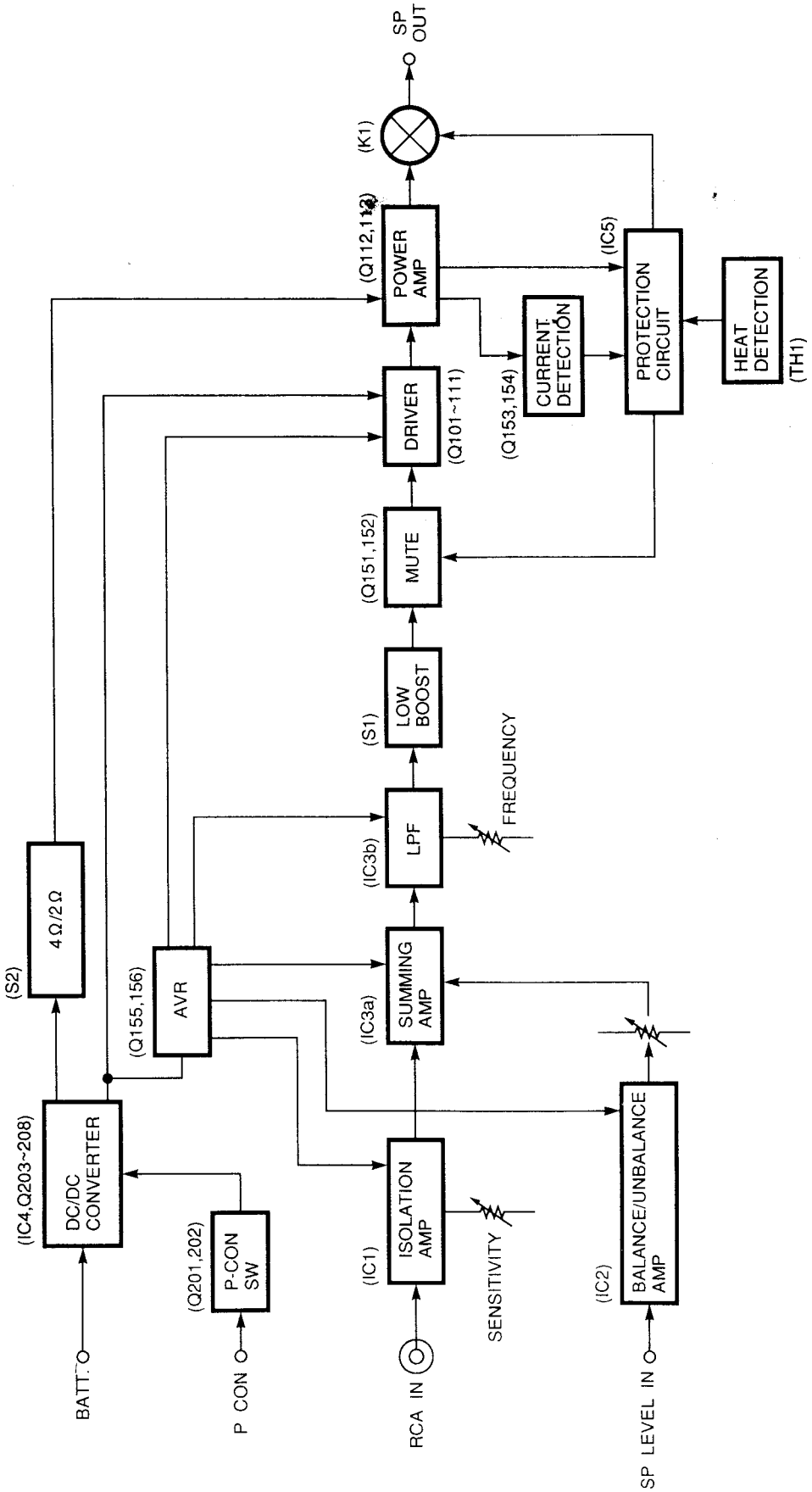


④Speaker selector switch



Set this switch according to the impedance of the speaker connected to the speaker output terminals of this unit.
In case two 4Ω speakers are connected in parallel, set this switch to the 2Ω position.

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Description of Components

AUDIO UNIT (X09-5020-10)

Ref. No.	Device	Use and Function	Operation and Condition
IC1	NJM4565D	Isolation amplifier	Eliminates car noise from the RCA input, and adjust its gain.
IC2	NJM4565D	Speaker level input amplifier	Balanced-unbalanced amplifier for the speaker level input.
IC3a	NJM4565D	Summing amplifier	Mixing of the RCA input and speaker level input.
IC3b	NJM4565D	LPF	Filter passing the lower frequencies than a threshold between 30 and 200Hz (variable).
IC4	µPC494C	Oscillator for DC/DC converter	
IC5	µPC1237HA	Protection	Overload DC offset. Activated by P-CON.
Q101, 102	2SC945(A) (Q,P)	Input differential amplifier	
Q103, 104	2SA992(F,E)	2nd stage differential amplifier	
Q105, 106	2SC1845(F,E)	3rd stage differential amplifier	
Q107	2SC1845(F,E)	Cascode stage	
Q108	2SA992(F,E)	Current mirror	
Q109	2SC945(A) (Q,P)	Temperature compensation	
Q110	2SC2590(Q,R)	Power drive stage	
Q111	2SA1110(Q,R)	Power drive stage	
Q112	2SC4387LB*5	Power stage	
Q113	2SA1672LB*5	Power stage	
Q151	2SC945(A) (Q,P)	Input muting	When the amplifier is switched OFF, activated before the relay to protect the relay contact.
Q152	DTA124ES	Input muting driver	
Q153	2SC1845(F,E)	Current detection	Activates IC5 upon detection of overcurrent.
Q154	2SA992(F,E)	Current detection	Activates IC5 upon detection of overcurrent.
Q155	2SC3940A(R,S)	AVR	±16V regulated voltage.
Q156	2SA1534A(R,S)	AVR	±16V regulated voltage.
Q201	2SC945(A) (Q,P)	P-CON ON detection.	
Q202	2SA1534A(R,S)	Power switch	Supplies power to IC4.
Q203, 204	2SC945(A) (Q,P)	Switching drive	
Q205, 206	2SA733(A) (Q,P)	Switching drive	
Q207, 208	2SK1946	Switching power stage	

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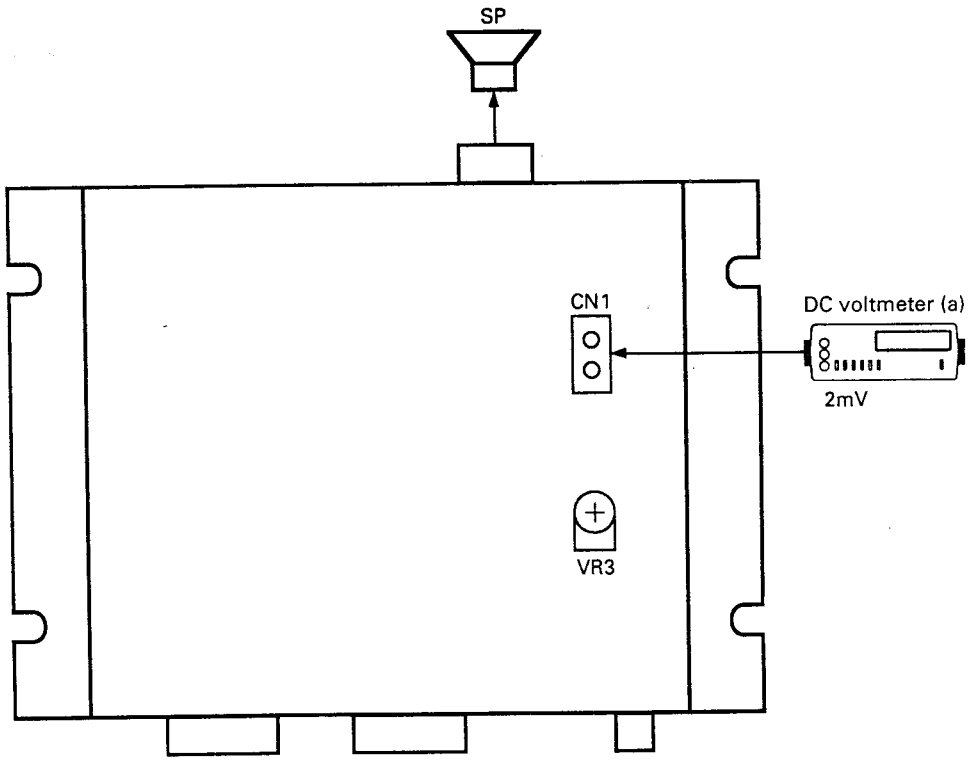
ADJUSTMENT

Adjustment

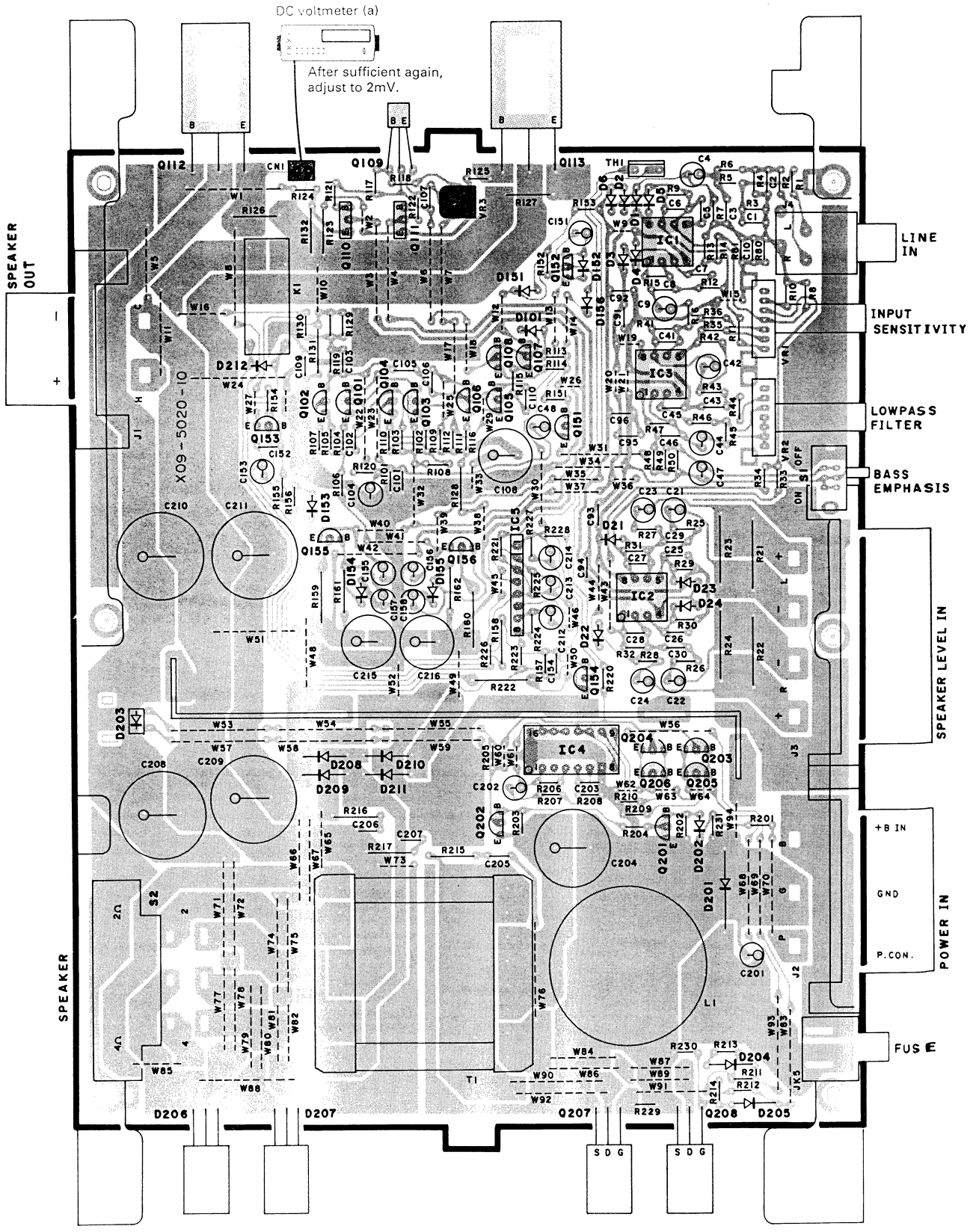
No.	Item	Input side setting	Output side setting	Receiver setting	Adjustment point	Adjustment method	Fig.
Connect a cassette deck.							
1	Non-signal current	–	Connect a DC voltmeter to CN1.	–	VR3	After sufficient aging, adjust to 2mV.	(a)

Adjustment Point



PC BOARD (COMPONENT SIDE VIEW)

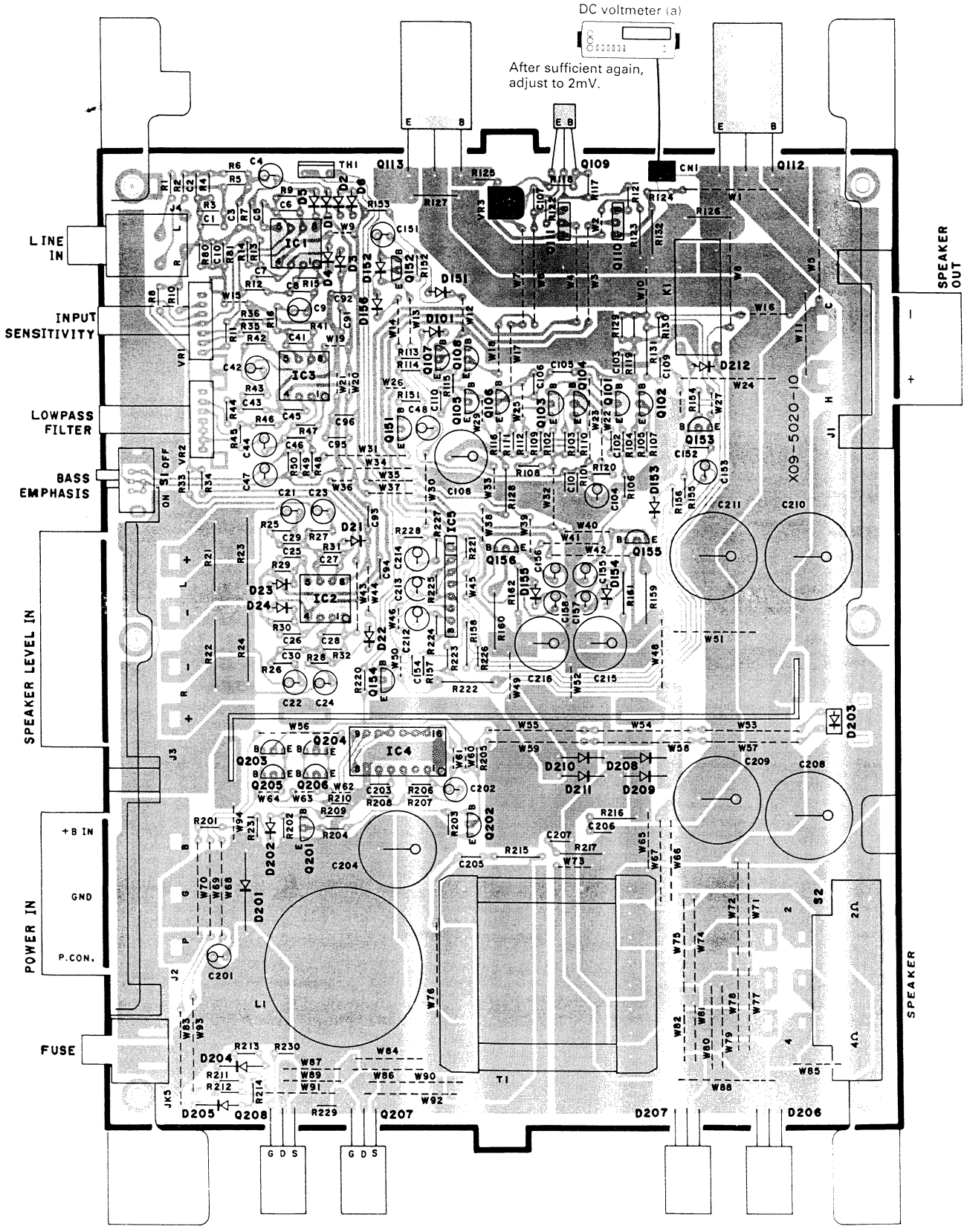
AUDIO UNIT
(X09-5020-10)



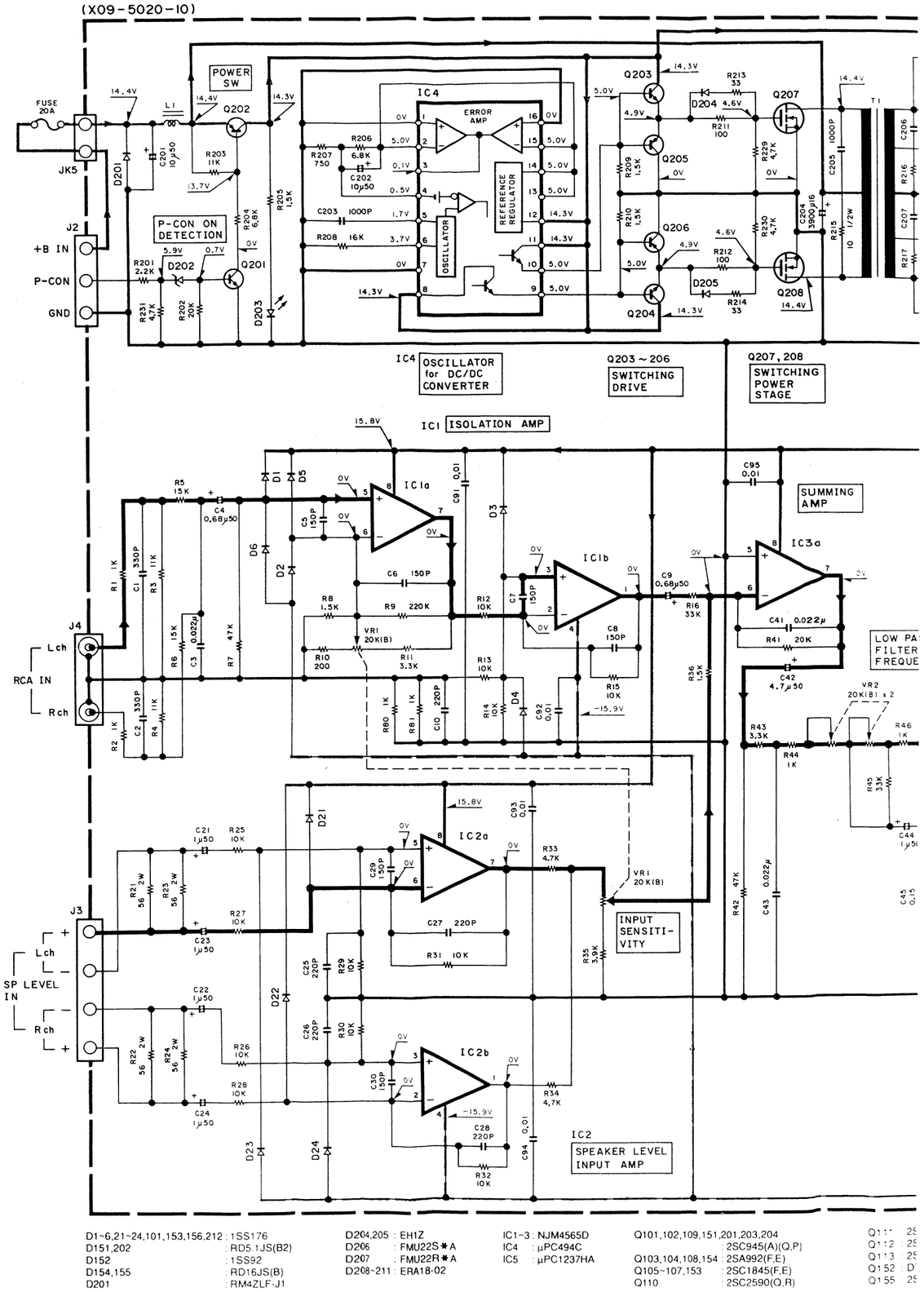
Refer to the schematic diagram for the values of resistors and capacitors.

PC BOARD (FOIL SIDE VIEW)

AUDIO UNIT
(X09-5020-10)



Refer to the schematic diagram for the values of resistors and capacitors.


(X09-5020-10)
POWER SW
FUSE 20A
JK5
J2
+B IN
P-CON
GND
P-CON ON DETECTION
IC4
ERROR AMP
REFERENCE REGULATOR
OSCILLATOR
IC4 OSCILLATOR for DC/DC CONVERTER
Q203 ~ 206 SWITCHING DRIVE
Q207, 208 SWITCHING POWER STAGE
IC1 ISOLATION AMP
IC1a
IC1b
IC3a
SUMMING AMP
J4
Lch
RCA IN
Rch
J3
SP LEVEL IN
IC2a
IC2b
IC2 SPEAKER LEVEL INPUT AMP
INPUT SENSITI-VITY
LOW PA FILTER FREQUE
D1~6,21~24,101,153,156,212 : 1SS176
D151,202 : RD5.1JS(B2)
D152 : 1SS92
D154,155 : RD16JS(B)
D201 : RM4ZLF-J1
D204,205 : EH1Z
D206 : FMU22S✱A
D207 : FMU22R✱A
D208~211 : ERA18-02
IC1~3 : NJM4565D
IC4 : μPC494C
IC5 : μPC1237HA
Q101,102,109,151,201,203,204 : 2SC945(A)(Q,P)
Q103,104,108,154 : 2SA992(F,E)
Q105~107,153 : 2SC1845(F,E)
Q110 : 2SC2590(Q,R)

E F G H I J K L M N O

Q203 ~ 206 SWITCHING DRIVE

Q207, 208 SWITCHING POWER STAGE

IC5 PROTECTION

RELAY DRIVER · VCC ON MUTE · OVER LOAD DET. · AC OFF DET. · FLIP-FLOP · OFFSET VOL. DET. · AUTO RECOVERY LATCH SW

Q109 TEMPERATURE COMPENSATION

Q153, 154 CURRENT DETECTION

AVR

SUMMING AMP

IC3a

LOW PASS FILTER FREQUENCY

IC3b L.P.F.

Q103, 104 2ND-STAGE DIFFERENTIAL AMP

Q101, 102 INPUT DIFFERENTIAL AMP

INPUT MUTING

INPUT SENSITIVITY

INPUT MUTING DRIVER

POWER DRIVE STAGE

CURRENT MIRROR

CASCODE STAGE

Q105, 106 3RD-STAGE DIFFERENTIAL AMP

POWER STAGE

IDLE CURRENT

SPEAKER OUT

SPEAKER LEVEL OUT AMP

Q101,102,109,151,201,203,204 : 2SC945(A)(Q,P)
Q103,104,108,154 : 2SA992(F,E)
Q105~107,153 : 2SC1845(F,E)
Q110 : 2SC2590(Q,R)

Q111 : 2SA1110(Q,R)
Q112 : 2SC4387LB*5
Q113 : 2SA1672LB*5
Q152 : DTA124ES
Q155 : 2SC3940A(R,S)

Q156,202 : 2SA1534A(R,S)
Q205,206 : 2SA733(A)(Q,P)
Q207,208 : 2SK1946

TH1 : PTH9M04BE222T
L1 : L33-0991-05

SIGNAL LINE
GND LINE
+B LINE
-B LINE

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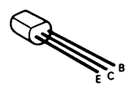
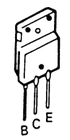
2SA1534A
2SA733(A)
2SA992
2SC1845
2SC3940A
2SC945(A)



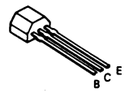
2SA1672LB*5
2SC4387LB*5



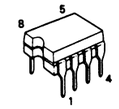
2SA1110
2SC2590

2SK1946

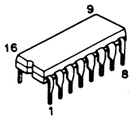
DTA124ES



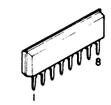
NJM4565D



µPC494C



µPC1237HA



- DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

CAUTION : For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

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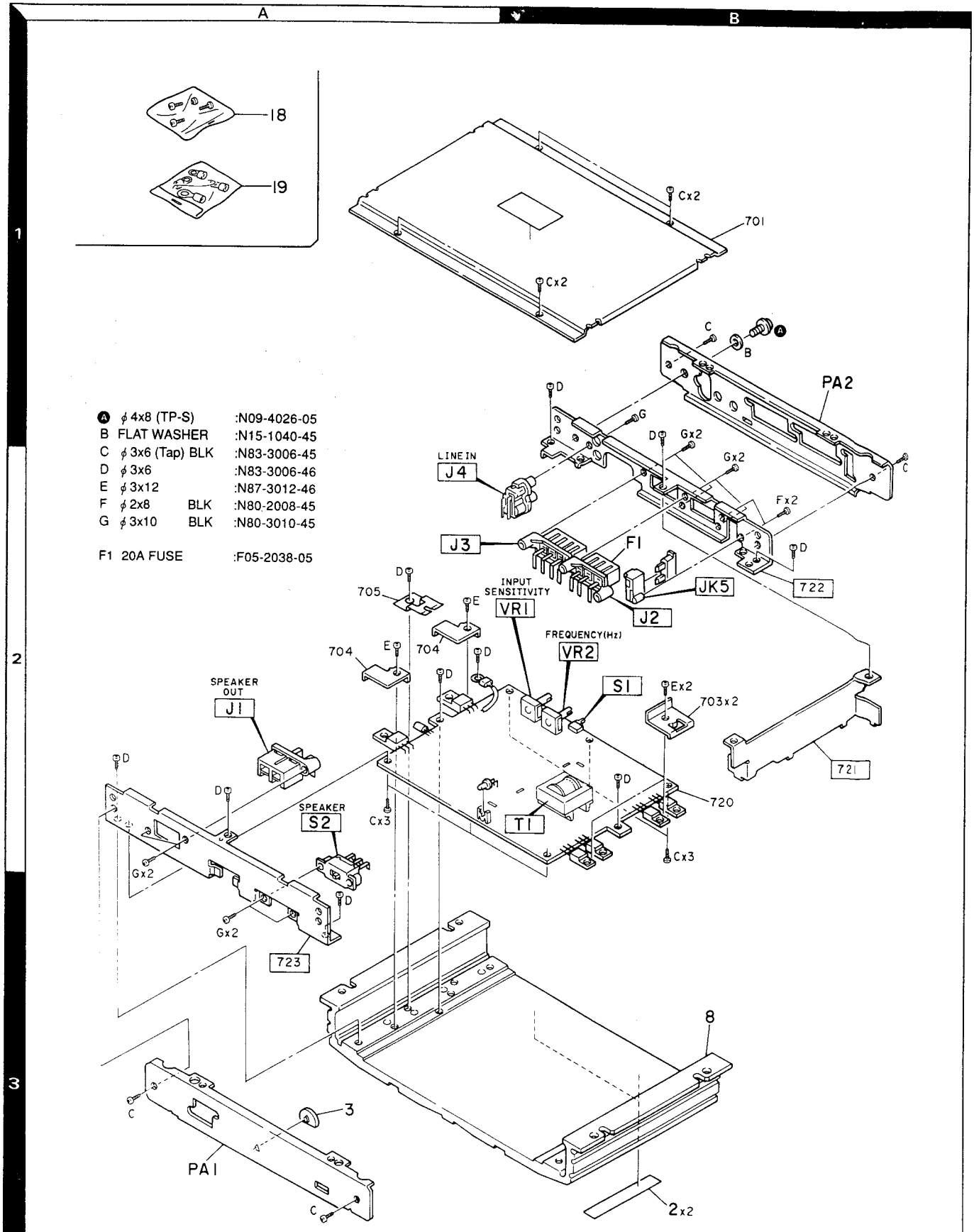
EXPLODED VIEW



A	φ 4x8 (TP-S)		:N09-4026-05
B	FLAT WASHER		:N15-1040-45
C	φ 3x6 (Tap)	BLK	:N83-3006-45
D	φ 3x6		:N83-3006-46
E	φ 3x12		:N87-3012-46
F	φ 2x8	BLK	:N80-2008-45
G	φ 3x10	BLK	:N80-3010-45
F1	20A FUSE		:F05-2038-05

Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnes dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
KAC-714						
PA1	3A	*	A64-0062-03	PANEL		
PA2	1B	*	A84-0015-03	REAR PANEL		
2	3B		B03-3007-04	DRESSING PLATE		
3	3A		B19-0850-04	LIGHTING BOARD		
-			B46-0100-20	WARRANTY CARD		
-		*	B64-0298-00	INST. MANUAL(ENG.,FRA.)	K	
-		*	B64-0299-00	INST. MANUAL(ENG.,FRA.)	E	
-		*	B64-0300-00	INST. MANUAL(GER.,NETH.)	E	
-		*	B64-0301-00	INST. MANUAL(ITA.,SPA.)	E	
8	3B	*	F01-1422-01	HEAT SINK		
F1	2B		F05-2038-05	FUSE (20A)		
-		*	H10-4444-03	POLYSTYRENE FOAMED FIXTURE		
-			H25-0321-04	PROTECTION BAG (600X315X0.03)		
-			H25-0336-04	PROTECTION BAG (170X250X0.03)		
-		*	H54-0081-04	ITEM CARTON CASE		
-		*	H64-0087-04	OUTER CARTON CASE		
18	1A		N99-1587-05	SCREW SET		
A	1B		N09-4026-05	TAPPING SCREW (4X8,TP,S)		
B	1B		N15-1040-45	FLAT WASHER (4)		
C	1B,3A		N83-3006-45	PAN HEAD TAPTITE SCREW		
D	2B		N83-3006-46	PAN HEAD TAPTITE SCREW		
E	2A,2B		N87-3012-46	BRAZIER HEAD TAPTITE SCREW		
⚠ 19	1A	*	W01-0725-05	ACCESSORY (CRITICAL P.)	E	
AUDIO UNIT (X09-5020-10)						
D203			B30-1342-05	LED		
C1 ,2			CC45FSL1H331J	CERAMIC 330PF J		
C3			CF92FV1H223J	MF 0.022UF J		
C4			CE04CW1HR68M	ELECTRO R68UF 50WV		
C5 -8			CC45FSL1H151J	CERAMIC 150PF J		
C9			CE04CW1HR68M	ELECTRO R68UF 50WV		
C10			CC45FSL1H221J	CERAMIC 220PF J		
C21 -24			CE04DW1H010M	ELECTRO 1.0UF 50WV		
C25 -28			CC45FSL1H221J	CERAMIC 220PF J		
C29 ,30			CC45FSL1H151J	CERAMIC 150PF J		
C41			CF92FV1H223J	MF 0.022UF J		
C42			CE04DW1H4R7M	ELECTRO 4.7UF 50WV		
C43			CF92FV1H223J	MF 0.022UF J		
C44			CE04DW1H010M	ELECTRO 1.0UF 50WV		
C45			CF92FV1H154J	MF 0.15UF J		
C46			CC45FSL1H270J	CERAMIC 27PF J		
C47			CE04DW1H010M	ELECTRO 1.0UF 50WV		
C48			CE04CW1HR68M	ELECTRO R68UF 50WV		
C91 -96			CK45FF1H103Z	CERAMIC 0.010UF Z		
C101			CF92FV1H102J	MF 1000PF J		
C102			CF92FV1H682J	MF 6800PF J		
C103			CC45FSL1H120J	CERAMIC 12PF J		
C104			CE04DW1A101M	ELECTRO 100UF 10WV		
C105			CC45FSL1H270J	CERAMIC 27PF J		
C106			CC45FSL1H080D	CERAMIC 8.0PF D		
C107			CF92FV1H102J	MF 1000PF J		

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PARTS LIST

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Parts without Parts No. are not supplied.
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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C108			CE04DW1H221M	ELECTRO 220UF 50WV		
C109			CF92FV1H473J	MF 0.047UF J		
C110			CC45FSL1H331J	CERAMIC 330PF J		
C151			CE04DW1H100M	ELECTRO 10UF 50WV		
C152			CK45FB1H222K	CERAMIC 2200PF K		
C153			CE04DW1H4R7M	ELECTRO 4.7UF 50WV		
C154			CK45FF1H103Z	CERAMIC 0.010UF Z		
C155-158			CE04DW1H4R7M	ELECTRO 4.7UF 50WV		
C201,202			CE04DW1H100M	ELECTRO 10UF 50WV		
C203			CF92FV1H102J	MF 1000PF J		
C204		*	C90-2788-05	ELECTRO 3900UF 16WV		
C205-207			CF92FV1H102J	MF 1000PF J		
C208-211		*	C90-2787-05	ELECTRO 1500UF 50WV		
C212			CE04DW1H100M	ELECTRO 10UF 50WV		
C213			CE04DW1A101M	ELECTRO 100UF 10WV		
C214			CE04DW1H2R2M	ELECTRO 2.2UF 50WV		
C215,216			CE04DW1H221M	ELECTRO 220UF 50WV		
CN1			E40-3640-05	PIN ASSY		
J1	2A	*	E70-0810-05	SCREW TERMINAL BOARD(2P)		
⚠ J2	2B		E70-0807-05	SCREW TERMINAL BOARD(3P)		
J3	2B	*	E70-0811-05	SCREW TERMINAL BOARD(4P)		
J4	2B	*	E63-0818-05	PHONO JACK		
W1			E31-5000-05	JUMPER WIRE		
W3 ,4			E31-5000-05	JUMPER WIRE		
W6 -8			E31-5000-05	JUMPER WIRE		
W11			E31-5000-05	JUMPER WIRE		
W22 -24			E31-5000-05	JUMPER WIRE		
W31			E31-5000-05	JUMPER WIRE		
W42			E31-5000-05	JUMPER WIRE		
W51			E31-5000-05	JUMPER WIRE		
W53 -59			E31-5000-05	JUMPER WIRE		
W66 -72			E31-5000-05	JUMPER WIRE		
W74 -80			E31-5000-05	JUMPER WIRE		
W83			E31-5000-05	JUMPER WIRE		
W88			E31-5000-05	JUMPER WIRE		
W90			E31-5000-05	JUMPER WIRE		
W92 ,93			E31-5000-05	JUMPER WIRE		
⚠ JK5	2B		J13-0602-05	FUSE HOLDER (CRITICAL P.)		
L1			L33-0991-05	CHOKE COIL		
T1	2B	*	L19-0533-05	TRANSFORMER FOR CONVERTER		
C	2B		N83-3006-45	PAN HEAD TAPTITE SCREW		
D	2B		N83-3006-46	PAN HEAD TAPTITE SCREW		
F	2B		N80-2008-45	PAN HEAD TAPTITE SCREW		
G	2A,2B		N80-3010-45	PAN HEAD TAPTITE SCREW		
R12 -15			RN14BK2C1002F	RN 10.0K F 1/6W		
R21 -24			RS14KB3D560J	FL-PROOF RS 56 J 2W		
R123			RD14DB2H101J	SMALL-RD 100 J 1/2W		
R126,127			R92-0205-05	METAL-PLATE 0.1 K 2W		
R128			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R131			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R132			RD14DB2H101J	SMALL-RD 100 J 1/2W		
R159,160			RS14KB3A471J	FL-PROOF RS 470 J 1W		
R215-217			RD14DB2H100J	SMALL-RD 10 J 1/2W		

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R222			RS14KB3A471J	FL-PROOF RS 470 J 1W		
VR1 ,2	2B	*	R10-0627-05	POTENTIOMETER(20KX2)		
VR3			R12-0605-05	TRIMMING POT.(220)		
K1		*	S76-0019-05	MAGNETIC RELAY		
S1	2B		S62-0802-05	SLIDE SWITCH		
S2		*	S31-2136-05	SLIDE SWITCH (POWER TYPE)		
D1 -6			1SS176	DIODE		
D21 -24			1SS176	DIODE		
D101			1SS176	DIODE		
D151			RD5.1JS(B2)	ZENER DIODE		
D152		*	1SS92	DIODE		
D153			1SS176	DIODE		
D154,155			RD16JS(B)	ZENER DIODE		
D156			1SS176	DIODE		
D201			RM4ZLF-J1	DIODE		
D202			RD5.1JS(B2)	ZENER DIODE		
D204,205			EH1Z	DIODE		
D206		*	FMU22S*A	DIODE		
D207		*	FMU22R*A	DIODE		
D208-211		*	ERA18-02	DIODE		
D212			1SS176	DIODE		
IC1 -3			NJM4565D	IC(OP AMP X2)		
IC4			UPC494C	IC(SWITCHING REGULATOR)		
IC5			UPC1237HA	IC(POWER AMP)		
Q101,102			2SC945(A)(Q,P)	TRANSISTOR		
Q103,104			2SA992(F,E)	TRANSISTOR		
Q105-107			2SC1845(F,E)	TRANSISTOR		
Q108			2SA992(F,E)	TRANSISTOR		
Q109			2SC945(A)(Q,P)	TRANSISTOR		
Q110			2SC2590(Q,R)	TRANSISTOR		
Q111			2SA1110(Q,R)	TRANSISTOR		
Q112		*	2SC4387LB*5	TRANSISTOR		
Q113		*	2SA1672LB*5	TRANSISTOR		
Q151			2SC945(A)(Q,P)	TRANSISTOR		
Q152			DTA124ES	DIGITAL TRANSISTOR		
Q153			2SC1845(F,E)	TRANSISTOR		
Q154			2SA992(F,E)	TRANSISTOR		
Q155			2SC3940A(R,S)	TRANSISTOR		
Q156			2SA1534A(R,S)	TRANSISTOR		
Q201			2SC945(A)(Q,P)	TRANSISTOR		
Q202			2SA1534A(R,S)	TRANSISTOR		
Q203,204			2SC945(A)(Q,P)	TRANSISTOR		
Q205,206			2SA733(A)(Q,P)	TRANSISTOR		
Q207,208		*	2SK1946	FET		
TH1			PTH9M04BE222T	POSITIVE RESISTOR		

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SPECIFICATIONS

Specifications subject to change without notice.

Audio Section

Max Power Output (4 Ω)	200 W × 1
Rated Power Output (4 Ω)	100 W × 1 (30 Hz ~ 200 kHz, 0.08 %)
Rated Power Output (2 Ω)	150 W × 1 (1 kHz, 0.8 % THD)
Frequency Response (– 3 dB)	30 ~ 200 Hz
Signal to Noise Ratio	100 dB
Sensitivity (MAX.)	0.15 V (rated output)
(MIN.)	3.0 V (rated output)
Input Impedance	10 kΩ
Damping Factor (100 Hz)	More than 100
Low pass filter frequency (18 dB/oct.)	30 Hz ~ 200 Hz (Variable)

General

Operating Voltage	14.4 V (11 ~ 16 V allowable)
Current Consumption (1 kHz, 10%)	16 A
Dimensions (W × H × D)	280 × 50 × 170 mm
	(11 × 1-15/16 × 6-11/16 in.)
Weight	2.4 kg (5.3 lb)

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